

CLAIMS

1. Process for producing a leached fiber bundle, comprising:

- arranging a number of fiber preforms into an ordered fiber bundle preform,
- heating and drawing out the fiber bundle preform, with interstices being produced between individual fibers (2) and spacers (1),
- introducing at least one adhesive into the interstices (3) in the drawn-out fiber bundle with the aid of a pressure reduction,
- sheathing at least one end of the drawn-out fiber bundle with an etch-resistant protective layer,
- flexibilizing the fiber bundle by removing spacer material in the unsheathed regions, forming at least one rigid end region (11, 20) and at least one flexible region (13).

2. Process according to claim 1, wherein the pressure reduction is generated by pumps.

3. Process according to claim 1, wherein the pressure reduction is produced by cooling preheated gas volumes in the interstices in the drawn-out fiber bundle.

4. Process according to claim 1, wherein the at least one adhesive is introduced into the interstices (3) in two rigid end regions (11; 20) of the fiber bundle, to a filling height (h) of at least 0.5 cm.

5. Process according to claim 4, wherein the at least one adhesive is introduced into the interstices (3) in the two rigid end regions (11, 20) of the fiber bundle to the filling height (h) of 0.5 cm to 5 cm.

6. Process according to claim 4, wherein the at least one adhesive is introduced into the interstices (3) in the two rigid end regions (11, 20) of the fiber bundle to the filling height (h) of 1.5 cm to 2.5 cm.
7. Process according to claim 1, wherein the interstices (3) in two rigid end regions (11, 20) of the fiber bundle are completely filled by the at least one adhesive.
8. Process according to claim 1, wherein the at least one adhesive is cured thermally and/or by irradiation with light.
9. Process according to claim 8, wherein the at least one adhesive is cured using UV irradiation.
10. Process according to claim 1, wherein the at least one adhesive has a viscosity of $5 \cdot 10^{-2} \text{ Pa} \cdot \text{s}$ to $5 \text{ Pa} \cdot \text{s}$ at 25°C .
11. Process according to claim 1, wherein the at least one adhesive is resistant to hot etching acids and/or hot etching lyes and/or deionized water.
12. Process according to claim 1, wherein the at least one adhesive is based on epoxy and/or acrylate.
13. Process according to claim 1, wherein the at least one adhesive has at most a slight polishability.
14. Process according to claim 1, wherein the at least one adhesive contains nanoparticles.

15. Process according to claim 1, wherein the spaces between the optical fibers (21) in the transition regions (14) between the rigid end regions (11, 20) and the flexible regions (13) are filled with at least one additional adhesive (22) after the flexibilizing operation.

16. Process according to claim 15, wherein the at least one additional adhesive (22) is soft enough in the cured state to keep stresses away from the optical fibers (21) under mechanical load and in the cured state is hard enough not to be cut up by the optical fibers (21).

17. Process according to claim 15, wherein the at least one additional adhesive (22) is introduced with the aid of syringes with thin needles.

18. Process according to claim 15, wherein the at least one additional adhesive (22) is based on silicone and/or acrylate.

19. Process according to claim 1, wherein at least one end of the drawn-out fiber bundle is provided with a sleeve (10).

20. Leached fiber bundle comprising at least one flexible region (13) and rigid end regions (11, 20) which include interstices (3), and at least one adhesive introduced into the interstices (3) to a filling height (h) of at least 0.5 cm.

21. Leached fiber bundle according to claim 20, wherein the at least one adhesive is introduced into the interstices (3) to a filling height (h) of 0.5 cm to 5 cm.

22. Leached fiber bundle according to claim 20, wherein the at least one adhesive is introduced into the interstices (3) to a filling height (h) of 1.5 cm to 2.5 cm.

23. Leached fiber bundle comprising at least one flexible region (13) and rigid end regions (11, 20) which include interstices (3), the interstices (3) are completely filled with at least one adhesive.

24. Leached fiber bundle comprising at least one flexible region (13) and at least one rigid end region (11, 20) which includes interstices (3), and at least one adhesive whose viscosity in the uncured state is $5 \cdot 10^{-2}$ Pa•s to 5 Pa•s at 25°C is introduced into the interstices (3).

25. Leached fiber bundle according to claim 24, wherein the at least one adhesive introduced into the interstices (3) is resistant to hot etching acids and/or hot etching lyes and/or deionized water.

26. Leached fiber bundle according to claim 25, wherein the at least one adhesive introduced into the interstices (3) has at most a slight polishability.

27. Leached fiber bundle according to claim 24, wherein the at least one adhesive is based on epoxy and/or acrylate.

28. Leached fiber bundle according to claim 24, wherein the at least one adhesive contains nanoparticles.

29. Leached fiber bundle according to claim 24, wherein at least one additional adhesive (22) is introduced between the optical fibers (21) in at least one transition region (14) between the rigid end region (11, 20) and the flexible region (13).

30. Leached fiber bundle according to claim 29, wherein the at least one additional adhesive (22) in the transition region (14) is based on silicone and/or acrylate.

31. Leached fiber bundle according to claim 29, wherein the at least one additional adhesive (22) in the transition region (14) is soft enough in the cured state to keep stresses away from the optical fibers (21) under mechanical load and in the cured state is hard enough not to be cut into by the optical fibers (21).

32. Leached fiber bundle according to claim 24, wherein at least one end of the fiber bundle is provided with a sleeve (10).

33. Leached fiber bundle according to claim 24, wherein the fiber bundle is as an image light guide for the transmission of image information.

34. Leached fiber bundle according to claim 24, wherein the fiber bundle is located in an endoscope.

35. Leached fiber bundle according to claim 24, wherein the fiber bundle carries optical data for data transmission.

36. Leached fiber bundle according to claim 24, wherein the fiber bundle forms an optical interconnect.